Fermion-to-Photon Conversion of Signal for Signal Transit in Parallel with Graphene Layers to Reduce Transit Time in Electronic-Photonic Hybrid Processors

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Introduction

In the paper of 27 November 2025, a processor architecture was described which has as its backbone stacked graphene sheets surrounded by Coulomb Force Line-based establishment of superconductive pathways cutting through the graphene in the transverse (traditionally electrically insulative direction.)

This approach allows for electrons to travel fermionically for part of their journey, reducing the latency of optically reading/switching spin-direction-based stationary trapped electrons in processing and data storage systems. However, that innovation does not address the bottleneck in the form of more traditional travel time of electrons once they begin conducting conventionally in parallel with the conductive graphene layer. This paper will address itself to a strategy for further reducing this bottleneck.

Abstract

After fermions in the 27 November 2025 system make the leap into the targeted graphene layer, rather than allowing them to conduct electrically throughout the entire length of that layer until they reach the light-emitter mechanism which reads and writes data by modifying trapped electrons, a small portion of that graphene layer can be made to have light-emissive characteristics which result in the emission of photons reflexive to the introduction of current and at a precisely perpendicular angle moving toward a neighboring sheet. It may be advantageous to ensure that a *direct fermion-to-photon conversion* is achieved as the higher-velocity fermion would be better-able to reliably convert into a photon with sufficient consistency to allow traditionally non-light-emissive materials to function as an LED capable of supporting this function. Even after the interaction of the two fermions in the superconductive pathway and the change in their angular momentum which results, much of the full velocity of the fermions remains intact and it requires interaction with several atoms before velocity is slowed back to standard conductive velocity. In this zone, the potential for light-emission in a material is enhanced.

Between the two sheets would be a nano-mirror situated at 45-degree angle situated so as to reflect the light emitted as the result of interaction between the fermions and the graphene with sufficient precision so as to enable it to travel in parallel with the sheets in the inter-sheet space. This would allow photons to cut across the distance at light speed.

At the destination, a back-conversion into electrons could be carried out to support the function of the previously described (ibid.) light-emissive system for reading and writing bits by changing the spin direction of electrons in an

array of partially-open traps described in the publication of 7 May 2025 and 26 September 2025. There may be no practical means of avoiding this back-conversion step as it is necessary to be able to control precisely the initial phase of the light emitted in order to ensure extreme precision with regard to the photon strike positions vis-à-vis the electron trap walls.

It is also necessary to address the question of how phase control over that light is brought about. This requires sending an instruction of sorts to the control LED which cannot be routed through the same pathway through which current is delivered. The most sensible means of achieving this would be to generate a narrow but powerful magnetic field from above which operates on a different circuit and which would allow for the titration of phase and which would be temporally synchronized with the delivery of current.

Once data is read by the system, which relies upon the measurement of deviation to angular momentum of light caused by the discrete magnetism of trapped electrons, that data needs to be conveyed back to the user, which would entail further circuitry and the conversion of electrons in the position-sensitive photon strike detector back into fermions in another set of superconducting pathways which rapidly move the requested information upstream.

Conclusion

The greatest uncertainty in this author's mind regarding this proposal relates to the ability to convert the fermions/electrons into photons with a sufficient degree of reliability and with precise enough control over angular momentum that they can move between the graphene layers without touching the walls, which would readily absorb the light. The consistently outward orientation of the discrete magnetism of the graphene layers (attributable to the Coulomb force generating crystal external to the mechanism) may assist in this respect. As the superconductive properties of the primary pathway rely upon ensuring that the spin of electrons never projects magnetism in the direction of the fermions, they must necessarily always be oriented in a direction which is perpendicular relative to the layered graphene. Particularly in the aggregate, the graphene layers would become a weak solid-state magnet which, calibrated correctly, could help to ensure that photons traveling between layers are less likely to contact with and be absorbed by the walls.

Engineering this type of computer is highly complex but the manufacturing process for building it would be less complex and step-intensive than the fabrication process for conventional semiconductor-based processors. As long as we keep as our goal mitigation of the travel time of signals, bottlenecks can be mitigated or eliminated as they emerge.